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Facing away from the interviewer: Evidence of little benefit to eyewitnesses' memory performance

Alena Nash | Nathan Ridout | Robert A. Nash

Department of Psychology, School of Life and Health Sciences, Aston University, UK

Correspondence
*Alena Nash, Department of Psychology, Aston University, Birmingham B4 7ET, UK.
Email: nasha@aston.ac.uk

Summary

Averting gaze from another person's face generally improves cognitive performance, yet, little is known about how witnesses' gaze direction affects their recall during investigative interviews. Here, participants witnessed a video-recorded incident, and were interviewed via free recall and closed questions following a short delay. In Experiment 1, participants either faced the interviewer or faced away during the interview. In Experiment 2, alongside this manipulation, the interviewer also either faced the witness or faced away. In Experiment 3, witness gaze direction was manipulated alongside rapport-building. In Experiment 4, the effect of facing away was directly compared with that of eye-closure. Mini meta-analysis of all four experiments showed that the effect of witness gaze direction on memory performance was minimal. Furthermore, neither aversion of interviewer's gaze nor rapport-building magnified this effect. Added to the cumulative literature on eyewitness gaze aversion, these findings afford better estimates of the likely size of these effects.

1 | INTRODUCTION

Investigative interviews are complex social interactions, aimed at eliciting detailed and accurate memory reports (Scoboria, Memon, Trang, & Frey, 2013). Conventionally, the witness sits face-to-face with the interviewer throughout the interview. However, simultaneously being watched by and watching another person requires cognitive resources, which can lead to poorer task performance relative to, for example, situations involving unreciprocated gaze (Buchanan et al., 2014; Horwitz & McCaffrey, 2008). It is therefore plausible that the face-to-face setup of investigative interviews might sometimes disrupt witnesses' memory performance. In this article, we test the prediction that fully facing away from their interviewer might lead witnesses to recall more detail, and with greater accuracy, compared with witnesses who face their interviewer.

There are several reasons why the conventional face-to-face format of investigative interviews could be detrimental to witnesses' memory performance. Firstly, the social experience of being watched could be problematic. Various research studies have demonstrated that experiencing another person's visual gaze can rapidly increase one's physiological arousal (see Hamilton, 2016), and that in these circumstances people tend to become more self-aware (Myllyneva & Hietanen, 2015). In one study, participants viewed a staged crime event and were later interviewed either alone with the interviewer or with either one or two additional passive observers (Wagstaff et al., 2008). Generally, the authors found that as the number of observers increased, witnesses gave fewer correct responses to closed questions. In other studies, being watched or evaluated by another person has negatively affected participants' performance on tasks assessing attention, concentration, delayed recall, and executive function (Belletier et al., 2015; Eastvold, Belanger, & Vanderploeg, 2012; Horwitz & McCaffrey, 2008).

Face-to-face interactions involve not only the experience of being watched, but also the need to monitor the interlocutor's facial cues. This monitoring typically exerts a cognitive load, requiring additional processing resources and thus providing distraction that can increase erroneous recall (Doherty-Sneddon & Phelps, 2005; Perfect, Andrade, & Eagan, 2011; Perfect, Andrade, & Syrett, 2012).

Consequently, people often spontaneously avert their gaze during cognitively demanding tasks as a means of controlling the amount of environmental input (e.g., Doherty-Sneddon, Bruce, Bonner, Longbotham, & Doyle, 2002; Glenberg, Schroeder, & Robertson, 1998). In studies that compared face-to-face investigative interviews with equivalent interviews conducted via videoconference, participants sometimes reported feeling better able to concentrate, and more comfortable with looking away, when the interviewer was not physically in front of them, even though this did not clearly benefit interview outcomes (Kuivaniemi-Smith, Nash, Brodie, Mahoney, & Rynn, 2014; Nash, Houston, Ryan, & Woodger, 2014). In similar work with children, video-mediated interviews reduced the amount of incorrect information and misinformation being reported, relative to face-to-face interviews (e.g., Doherty-Sneddon & McAuley, 2000).

Even in non-social study paradigms, visual facial stimuli depicting direct gaze can attract attention away from other objects in the environment (e.g., Conty, Gimmig, Belletier, George, & Huguet, 2010; Lyyra, Astikainen, & Hietanen, 2018). For example, Mares, Smith, Johnson, and Senju (2016) found that participants attended more quickly to pictures of faces with a direct gaze, than to either faces with an averted gaze or buildings. Additionally, no significant difference in eye-movement was found between the latter two types of image, thus implying that it is direct gaze specifically that draws attention, rather than facial stimuli per se. In sum, direct gaze toward another face can evoke physiological arousal, promote self- and social awareness, increase cognitive load, and impact on other more fundamental attentional demands. Thus, we could predict that face-to-face interaction would be detrimental to witnesses' memory performance during investigative interviews. Whereas research has explored the effectiveness of interviews conducted without a physically-present interviewer (Gabbert, Hope, & Fisher, 2009; Gawrylowicz, Memon, & Scoboria, 2014; Nash et al., 2014; Taylor & Dando, 2018), in current investigative practice at least one other person would normally be present with the witness during an interview.

One technique that could help to solve both the problem of the witness being observed by, and also observing, the interviewer is witness gaze aversion. Averting one's gaze is generally found to facilitate performance on visual–spatial cognitive tasks, by disengaging from the environment and directing focus toward the task (e.g., Doherty-Sneddon, Bonner, & Bruce, 2001; Markson & Paterson, 2009). In Buchanan et al. (2014), for instance, participants' performance on a mental navigation task was enhanced whenever gaze between them and another person was unreciprocated, or when they had their eyes closed. Conversely, performance was poorest when participants had to maintain eye contact or continuously look at the other person's face. As noted above, people tend to spontaneously avert their gaze when answering questions, and Glenberg et al. (1998) found that participants did so more frequently as the questions became more difficult. Additionally, the authors reported that eye-closure facilitated more accurate responses to moderately difficult math and general knowledge questions. Indeed, more recent studies – conducted both in the lab and in more naturalistic settings – show that asking witnesses to close their eyes during an interview can benefit their memory performance in both closed questioning and free recall (e.g., Nash, Nash, Morris, & Smith, 2016; Perfect et al., 2008; Vredeveldt et al., 2015; Vredeveldt & Penrod, 2013). Two theoretical accounts of these facilitative effects receive support from empirical studies. Firstly, the general cognitive load hypothesis suggests that closing or averting the eyes frees up cognitive resources due to no longer having to monitor environmental cues. Secondly, the modality-specific interference hypothesis suggests that closing or averting the eyes allows people to better visualise the to-be-recalled material, leading to better performance on visual tasks in particular. The former hypothesis is supported by findings that show improvements in performance that extend to auditory materials, rather than only to visual materials (Glenberg et al., 1998; Perfect et al., 2008), whereas the latter is supported by findings showing that closing the eyes enhances performance on visual tasks to a greater extent than for auditory tasks (e.g., Vredeveldt & Penrod, 2013).

To complement the literature on eye-closure, it is important to empirically test alternative forms of gaze aversion that might support investigative interviewing. Cognitive Interview training resources recommend that if witnesses are reluctant to close their eyes, they might instead be asked to focus on a blank wall, floor, or elsewhere free of distraction (e.g., Fisher & Geiselman, 1992). However, research is currently lacking on whether alternatives to eye-closure are indeed beneficial. Here we were interested in the effectiveness of a strong interpretation of this advice, namely, creating the dynamic recommended in early forms of hypnotic interviews and psychoanalysis, whereby the interviewer (or therapist) sits behind the interviewee (patient), rather than in front of them (Freud, 1913/2001). In four experiments, we investigated the effects of this technique in mock investigative interviews by manipulating the direction in which the witness faced (Facing interviewer vs. Facing away) and measuring their recall of a mock crime.

2 | EXPERIMENT 1

2.1 | Method

2.1.1 | Participants and design

Based on key studies that found large effects of witness eye-closure (in particular, $d = 0.98$ for correct recall in Perfect et al., 2008), we began with a small study designed to detect between-group effects of this magnitude ($d = 0.9$, $\alpha = .05$, power = .80, two-tailed). In total, 42 undergraduate students (37 females, 5 males; aged 18–24; $M = 19.62$, $SD = 1.36$) took part in exchange for course credit. The study employed a between-subjects design with witness gaze direction (Facing interviewer vs. Facing away) as the independent variable, and witness free recall (correct, incorrect, and overall accuracy) and closed question responses (correct, incorrect, don't know, and overall accuracy) as the dependent variables.

2.1.2 | Materials

Crime event

Participants saw a 2 min 13 s film-clip of a non-violent car theft, whereby a man parks his car on the street, and it is later broken into and stolen by another male. The clip contained no auditory information except for general background noise; the present studies thus focus solely on the recall of visual information.

Measures

Participants completed the Situational Self-Awareness scale (Govern & Marsch, 2001), and Brief Social Phobia scale (Davidson et al., 1997), which are described further in the Supporting Information. They also completed the measure of rapport created by Vallano and Schreiber Compo (2011), which contains nine items about the interviewer (e.g., 'friendly'; α = .81 in this study) and 18 about the social interaction (e.g., 'cooperative'; α = .54 – we later discuss and remedy the low reliability of this scale). For each item, participants made ratings on 7-point scales (where 1 = low and 7 = high on the particular characteristic).

2.1.3 | Procedure

All four experiments received favourable ethical opinions from an institutional ethics committee. All participants were tested individually in a quiet laboratory, and the same interviewer conducted all interviews; participants were told that the study concerned memory for observed events.

After consenting, participants were asked to watch the film-clip, and immediately afterwards they completed a 10-min filler task, which involved solving arithmetic puzzles. Next, the free recall stage began. All participants were seated across a desk from the interviewer, who provided standardised verbal instructions based on the Cognitive Interview (Milne, 2004). The interviewer asked that participants report everything they could remember about the film without missing any detail out, no matter how unimportant it seemed. The interviewer emphasised that the information could be described in any order, and to avoid guessing. The interviewer also explained that participants were free to recall at their own pace.

After these instructions, the experimental manipulation was implemented. All participants were randomly allocated to one of two conditions prior to the experiment, resulting in an equal number in each condition. Participants in the 'Facing away' condition were asked to turn their chair 180° to face a blank wall so that they were unable to see the experimenter's face even in their peripheral vision. Those in the 'Facing interviewer' condition received no additional instruction, and therefore all remained facing the interviewer (no participants spontaneously turned away or closed their eyes). Note that participants in the latter condition were not specifically asked to maintain eye-contact with the interviewer, as any technique proposed to improve witnesses' performance (in this case, facing away) should, in practice, be beneficial above and beyond what people would otherwise do spontaneously. All participants regardless of condition were told that the interview arrangements were designed to help them concentrate on remembering, and that the interviewer would remain quiet and take notes whilst the participant spoke, without interrupting. Participants were told to tell the interviewer when they could remember no more, and were given opportunity to ask questions. Then, the interviewer prompted participants to tell everything they could remember.

Once participants exhausted their free recall, they were next asked 10 closed questions about visual aspects of the film. During this questioning, the witness remained in the same facing position as for free recall, and if 'Facing away' participants began to turn around, they were asked to remain seated in the same position. All participants were reminded to avoid guessing. Furthermore, they were encouraged to say 'don't know' where appropriate, because research shows that this kind of instruction can improve the overall quality of witness reports by reducing the number of errors (Scoboria & Fisico, 2013; Scoboria, Mazzoni, & Kirsch, 2008). Again, the interviewer did not interrupt participants' answers or provide feedback, but instead simply wrote them down. The free recall and closed questions were audio-recorded to allow for transcription and coding.

Once the interview stage was complete, all participants used a computer to complete the Situational Self-Awareness Scale, Brief Social Phobia Scale, and rapport measure in that order, whilst the experimenter waited outside the laboratory to avoid social pressure. Finally, the experimenter returned and participants were debriefed.

2.1.4 | Data coding

After all data were collected, free recall responses were transcribed verbatim and coded blind to condition. This process involved using an exhaustive coding template, listing over 150 details from the crime film. A detail reported by each participant was scored as correct if it was present in the film and described correctly, and it was scored as incorrect if it was either described incorrectly or not present in the film. Whenever participants changed their mind about a particular detail, only their final responses were coded, and details expressed with uncertainty were nevertheless still coded. Any subjective details were ignored (e.g., 'you're not supposed to park there').

For each closed question, prior to data collection we established which answers we would accept as correct. Responses to each question were coded as either correct, incorrect or 'don't know'. If the participant changed their mind, only their final response was coded, and if they expressed uncertainty about their answer, this was nevertheless coded as their answer rather than as 'don't know'.

A total of 21 randomly selected transcripts were scored by an independent coder who was also blind to experimental condition. Inter-rater reliability was good for free recall correct details (r = .98)

and incorrect details (r = .85), and was 100% for closed questions. Therefore, the first coder's scores were retained for analyses.

2.2 | Results

To answer our main research questions, we looked at participants' responses during free recall and closed questions in turn, and compared the number of details recalled between the two witness gaze direction conditions.[1]

2.2.1 | Free recall

Overall, participants correctly recalled between 15 and 51 details (M = 32.64). We conducted a series of independent samples t tests to assess the effect of witness gaze direction. As represented in Table 1, these tests showed no significant differences in the number of correct details, $t(40) = -0.77$, $p = .45$, $d = -0.24$, 95% CI on d [−0.84, 0.37], or incorrect details, $t(40) = -0.32$, $p = .75$, $d = -0.10$ [−0.70, 0.51]. Overall accuracy was calculated by dividing the number of correct details by the sum of correct and incorrect details. Again, analysis of these accuracy scores indicated no significant difference between conditions, $t(40) = 0.17$, $p = .86$, $d = 0.05$ [−0.55, 0.66].

To further explore our non-significant findings, we conducted Bayesian independent samples t tests on these data, using JASP. By convention, Bayes Factors BF_{01} between 1 and 3 indicate anecdotal evidence for the null hypothesis, values between 3 and 10 indicate substantial evidence, and values greater than 10 indicate strong evidence (Jarosz & Wiley, 2014). As Table 1 shows, these tests all indicated anecdotal or substantial evidence for the null hypothesis.

In summary, contrary to our predictions, neither the quantity nor the accuracy of details reported during free recall were substantially influenced by the witnesses' gaze direction.

2.2.2 | Closed questions

As Table 1 shows, there were no significant differences between the two witness gaze direction conditions in terms of either correct, $t(40) = -1.02$, $p = .32$, $d = -0.31$ [−0.92, 0.29], incorrect, $t(40) = 1.27$, $p = .21$, $d = 0.39$ [−0.22, 1.00], or 'Don't know' responses, $t(40) = 0.12$, $p = .90$, $d = 0.04$ [−0.57, 0.64].

The overall accuracy of participants' responses was calculated as the proportion of correct responses participants gave whenever they chose to answer a question (i.e., excluding 'Don't know' responses). Analysis of these scores again showed no significant differences between conditions, $t(40) = -1.18$, $p = .25$, $d = -0.36$ [−0.97, 0.25].

As Table 1 shows, Bayesian independent samples t tests showed anecdotal to substantial evidence for the null hypothesis for all effects in closed questioning.

2.2.3 | Additional analyses

One possible concern with asking witnesses to face away from an interviewer is that doing so might make them uncomfortable. To explore this issue, we analysed participants' responses to the rapport measure. This analysis – along with those for the social phobia and situational self-awareness data – is reported in the Supporting Information; there were no significant differences between conditions to note.

3 | EXPERIMENT 2

Given the results of previous studies on gaze aversion (e.g., Buchanan et al., 2014) and eye-closure (e.g., Nash et al., 2016; Perfect et al., 2008; Vredeveldt, Baddeley, & Hitch, 2013), it is surprising to find no indication that facing away enhanced participants' memory performance. To improve the robustness of our conclusions, in Experiment 2 we set out to replicate the witness gaze direction manipulation in a better-powered study, and we also took more deliberate steps to build rapport with participants. Rapport-building is a standard recommendation for all investigative interviews (e.g., Vallano & Schreiber Compo, 2015), and may make people feel more comfortable with gaze aversion techniques (Nash et al., 2016). We therefore anticipated being better able to detect a benefit of facing away if participants first built rapport with the interviewer.

Furthermore, in Experiment 2 we manipulated the interviewer's gaze direction independently of the witness's gaze direction.

TABLE 1 Effects of witness gaze condition on dependent variables in Experiment 1 (standard deviations in parentheses)

Question type	Response type	Condition		BF_{01}
		Facing interviewer	Facing away	
Free recall	Correct	33.71 (9.53)	31.57 (8.54)	2.61
	Incorrect	1.90 (1.55)	1.76 (1.34)	3.17
	Overall accuracy	0.95 (0.04)	0.95 (0.05)	3.26
Closed questions (out of 10)	Correct	6.33 (1.71)	5.76 (1.92)	2.18
	Incorrect	1.29 (1.01)	1.81 (1.60)	1.74
	Don't know	2.38 (1.20)	2.43 (1.33)	3.28
	Overall accuracy	0.82 (0.14)	0.76 (0.20)	1.90

Participants in Experiment 1 (whether they faced the interviewer or faced away) were observed by the interviewer throughout the whole interview, and we know that being watched while completing a cognitive task can hinder performance (Eastvold et al., 2012; Wagstaff et al., 2008). Therefore, we might predict that this feeling of being observed could counter any benefit of the witness facing away. So, in Experiment 2, the interviewer faced away from half of participants and remained facing the other half, while simultaneously we asked half of participants to face away from the interviewer, and half remained facing them.

3.1 | Method

3.1.1 | Participants and design

In total, 128 undergraduate students (115 females, 13 males; aged 18–44; *M* = 19.95, *SD* = 3.17) participated either for course credits or without compensation. Participants from Experiment 1 were not able to take part. Power analysis showed this sample size to be appropriate for detecting a medium-sized effect in our study design (*f* = .25), assuming α = .05 and power = .80, two-tailed. The study used a 2 (Interviewer gaze: Facing witness vs. Facing away) x 2 (Witness gaze: Facing interviewer vs. Facing away) between-subjects design.

3.1.2 | Materials

All materials were identical to those used in Experiment 1.

3.1.3 | Procedure

The procedure closely followed that of Experiment 1 with two exceptions. The first was the addition of rapport-building for all participants, immediately after completion of the filler task, whilst participants were seated across a desk from the interviewer. The interviewer built rapport with participants by asking several questions (e.g., 'Which course and year are you in?') in a friendly tone while being attentive to the responses (Fisher & Geiselman, 1992). Additionally, these questions were sometimes expanded to engage participants in further conversation (e.g., 'What are your plans for next year?'), and the experimenter also reciprocated information about herself where appropriate. To allow for a more natural interaction the rapport-building was not recorded or timed; however it never lasted longer than 5 min.

Secondly, we added a manipulation of interviewer gaze direction, which imitated the witness gaze direction manipulation. In the 'Facing away' condition, the interviewer turned her chair 180° to face away from the participant during both the free recall and closed questioning interview phases; in the 'Facing witness' condition, she remained facing the participant. Witness gaze direction was manipulated as in Experiment 1, whereby half of participants turned the chair 180° to face a blank wall in the 'Facing away' condition, whilst the other half remained in the 'Facing interviewer' setup. All participants received the same verbal instructions as in Experiment 1, in addition to being told that the interviewer will face away, where appropriate, and regardless of condition they were told the interview format was designed to help them concentrate on remembering. For those participants who faced away from the interviewer whilst the interviewer also faced away, the interviewer took no steps to check whether participants occasionally looked around during the interview. However, their seating position remained facing away throughout in all cases.

3.1.4 | Data coding

All responses were coded as in Experiment 1, blind to condition. This time, 25 randomly selected transcripts were also scored by an independent coder who was also blind to condition. Inter-rater reliability was good for free recall correct details (*r* = .97) and incorrect details (*r* = .79). Similarly, the reliability was good for responses to closed questions: correct responses (*r* = .96), incorrect responses (*r* = .91), 'Don't know' responses (*r* = .99). Therefore, the first coder's scores were retained for analyses.

3.2 | Results

3.2.1 | Free recall

Correct details

Overall, participants recalled between 11 and 62 correct details (*M* = 30.86). A 2 (Interviewer gaze: Facing witness vs. Facing away) x 2 (Witness gaze: Facing interviewer vs. Facing away) between-subjects ANOVA on the number of correct details reported revealed no significant main effect of interviewer gaze, $F(1,124) = 0.04$, $p = .85$, $\eta_p^2 < .01$, $d = 0.03$ [–0.31, 0.38], or witness gaze, $F(1,124) = 0.08$, $p = .77$, $\eta_p^2 < .01$, $d = 0.05$ [–0.30, 0.40], nor a significant interaction, $F(1,124) = 0.05$, $p = .83$, $\eta_p^2 < .01$ (see Table 2).

Incorrect details

An ANOVA on the number of incorrect details showed no significant main effect of interviewer gaze, $F(1,124) = 0.51$, $p = .48$, $\eta_p^2 < .01$, $d = –0.13$ [–0.47, 0.22], witness gaze, $F(1,124) = 1.08$, $p = .30$, $\eta_p^2 = .01$, $d = –0.18$ [–0.53, 0.16], nor a significant interaction, $F(1,124) = 1.88$, $p = .17$, $\eta_p^2 = .01$.

Overall accuracy

An ANOVA on overall accuracy scores revealed no significant main effect of interviewer gaze, $F(1,124) = 0.26$, $p = .61$, $\eta_p^2 < .01$, $d = 0.09$ [–0.26, 0.44], or witness gaze, $F(1,124) = 1.59$, $p = .21$, $\eta_p^2 = .01$, $d = 0.22$ [–0.12, 0.57], nor a significant interaction, $F(1,124) = 2.02$, $p = .16$, $\eta_p^2 = .02$.

In summary, neither the interviewer's nor the witness's gaze direction made a meaningful difference to how much information participants reported in free recall, and all effect sizes were negligible.

TABLE 2 Effects of interviewer and witness gaze condition on dependent variables in Experiment 2 (standard deviations in parentheses). BF_{01} represents Bayesian evidence for the null hypothesis

	Interviewer gaze direction	Condition				Witness gaze direction	Interviewer gaze direction	Interaction
		Facing witness		Facing away				
Response type	Witness gaze direction	Facing interviewer	Facing away	Facing interviewer	Facing away	BF_{01}	BF_{01}	BF_{01}
Free recall	Correct	30.22 (12.12)	31.16 (8.57)	30.97 (10.00)	31.09 (10.65)	5.10	5.21	3.83
	Incorrect	2.00 (1.85)	1.31 (1.40)	1.41 (1.58)	1.50 (1.59)	3.24	4.21	1.78
	Overall accuracy	0.94 (0.06)	0.96 (0.04)	0.95 (0.05)	0.95 (0.05)	2.59	4.71	1.55
Closed questions (out of 10)	Correct	6.03 (1.58)	6.44 (1.34)	5.91 (1.78)	6.09 (1.49)	3.11	3.80	3.78
	Incorrect	1.34 (1.12)	1.06 (0.98)	1.81 (1.31)	1.19 (0.82)	0.42[a]	1.82	2.71
	Don't know	2.59 (1.34)	2.50 (1.37)	2.28 (1.37)	2.72 (1.22)	4.15	5.20	2.27
	Overall accuracy	0.82 (0.15)	0.86 (0.12)	0.76 (0.18)	0.83 (0.13)	0.50[a]	1.28	3.34

[a]Bayes Factors for the effect of witness gaze direction on incorrect responses to closed questions, and on overall accuracy in closed questioning, both indicate anecdotal evidence for the alternative hypothesis.

Bayesian ANOVAs showed anecdotal to substantial evidence for the null hypothesis in all cases (see Table 2).

3.2.2 | Closed questions

Correct responses

As Table 2 shows, a 2 (Interviewer gaze: Facing witness vs. Facing away) x 2 (Witness gaze: Facing interviewer vs. Facing away) between-subjects ANOVA on the number of correct responses to questions showed no significant main effect of interviewer gaze direction, $F(1,124) = 0.73$, $p = .40$, $\eta_p^2 = .01$, $d = -0.15$ [−0.50, 0.20], or witness gaze direction, $F(1,124) = 1.17$, $p = .28$, $\eta_p^2 = .01$, $d = 0.19$ [−0.16, 0.54], nor a significant interaction, $F(1,124) = 0.16$, $p = .69$, $\eta_p^2 < .01$.

Incorrect responses

Another ANOVA on the number of incorrect responses showed no significant main effect of interviewer gaze, $F(1,124) = 2.45$, $p = .12$, $\eta_p^2 = .02$, $d = 0.27$ [−0.08, 0.62]. However, witnesses gave significantly more incorrect responses when they faced the interviewer, compared to when they faced away, $F(1,124) = 5.70$, $p = .02$, $\eta_p^2 = .04$, $d = -0.42$ [−0.77, −0.07]. The interaction was non-significant, $F(1,124) = 0.82$, $p = .37$, $\eta_p^2 = .01$.

'Don't know' responses

An ANOVA on the number of questions answered with 'Don't know' revealed no significant main effect of interviewer gaze, $F(1,124) = 0.04$, $p = .84$, $\eta_p^2 < .01$, $d = -0.04$ [−0.38, 0.31], or witness gaze, $F(1,124) = 0.54$, $p = .47$, $\eta_p^2 < .01$, $d = 0.13$ [−0.22, 0.47], nor a significant interaction, $F(1,124) = 1.28$, $p = .26$, $\eta_p^2 = .01$.

Overall accuracy

An ANOVA on participants' accuracy scores showed no significant main effect of interviewer gaze, $F(1,124) = 3.24$, $p = .07$, $\eta_p^2 = .03$, $d = -0.31$ [−0.66, 0.03]; however, participants were significantly more accurate overall when facing away from the interviewer than when they faced them, $F(1,124) = 5.32$, $p = .02$, $\eta_p^2 = .04$, $d = 0.41$ [0.06, 0.76]. The interaction was non-significant, $F(1,124) = 0.23$, $p = .63$, $\eta_p^2 < .01$. Because these overall accuracy scores were not normally distributed, we also used Mann–Whitney tests which confirmed that there was no significant main effect of interviewer gaze on overall accuracy – $U = 1{,}696.50$, $p = .09$. The effect of witness gaze, however, was no longer statistically significant when analysed in this way ($U = 1{,}646.50$, $p = .05$).

Overall, only the witness gaze manipulation had a somewhat positive impact on participants' responses to questions. Those who faced the interviewer answered more questions incorrectly, and were less accurate overall in their responses (although the latter effect did not hold when analysed using a non-parametric test). In contrast, interviewer's gaze direction had no significant impact on the dependent measures. Overall, Bayesian ANOVAs showed only anecdotal evidence for the alternative hypothesis regarding the effects of witness gaze on incorrect responses and overall accuracy in closed questioning. All other Bayes Factors showed anecdotal to substantial evidence for the null hypothesis (see Table 2).

3.2.3 | Additional analyses

Analyses of rapport with the interviewer, social phobia and situational self-awareness are again reported in Supporting Information. There was only one statistically significant effect, whereby self-awareness of surroundings was greater when the interviewer faced the witness compared to facing away.

4 | EXPERIMENT 3

We previously proposed that witnesses might reap greater benefits from facing away from their interviewer if they first feel comfortable

in the interaction. In Experiment 1, we found no evidence of a facing-away benefit; whereas in Experiment 2 we took efforts to build rapport and we found weak, anecdotal evidence of a facing-away benefit within closed questioning only. In Experiment 3 we tested more directly the possibility that building a rapport with participants could enhance any effects of facing away. The interviewer built rapport with half of participants prior to their interview, and made no efforts to build rapport with the other half; simultaneously we asked half of the participants in each rapport condition to face away from the interviewer during the interview, and the other half faced the interviewer. We predicted that recall would be best when participants faced away from the interviewer and rapport-building is present. To strengthen the robustness of our conclusions, we pre-registered the protocol and analytic plan for Experiment 3.

4.1 | Method

4.1.1 | Participants and design

In total, 128 undergraduate students (107 females, 18 males, 3 did not specify their gender; aged 18–26; M = 19.05, SD = 1.22) participated either for course credits or without compensation. Participants from previous experiments were unable to take part. Power analysis showed this sample size to be appropriate for detecting a medium-sized effect (f = .25) in our study design, using α = .05 and power = .80, two-tailed. The study used a 2 (Witness gaze: Facing interviewer vs. Facing away) x 2 (Rapport-building: Rapport vs. No rapport) between-subjects design.

4.1.2 | Materials

All materials were identical to those used in Experiments 1 and 2 with the following exceptions. Firstly, a different silent film-clip, 1 min 37 s in length, was used to extend our findings to different materials. It depicted a bank robbery whereby a male threatens people with a gun inside a bank office, and leaves after filling his bag behind the counter. Secondly, for the interaction subscale of the rapport measure, we collected only 7 of the original 18 items (cooperative, harmonious, involving, friendly, active, positive, worthwhile), following the approach used by Vallano and Schreiber Compo (2011). Using this shorter subscale increased the internal reliability (α = .90 in this sample). For the interviewer subscale, all nine items were included.

4.1.3 | Procedure

The study protocol was pre-registered using AsPredicted.org (https://aspredicted.org/zx6ii.pdf) and followed that of Experiment 1 with the exception that we also manipulated rapport-building between-subjects. For half of participants within each witness gaze condition, the interviewer built rapport in the same manner as in Experiment 2; for the other half of participants the procedure was identical to Experiment 1, with no explicit efforts to build rapport.

4.1.4 | Data coding

All responses were coded blind to condition, using a new coding template for the bank robbery film, listing over 150 details. A total of 25 randomly selected transcripts were scored by an independent coder blind to condition. Inter-rater reliability was good for free recall: correct (r = .96) and incorrect details (r = .85). Reliability was similarly good for closed questions: correct (r = .97), incorrect (r = .98) and 'Don't know' responses (r = 1.00). Therefore, the first coder's scores were retained for analyses.

4.2 | Results

4.2.1 | Rapport manipulation check

We first checked whether rapport-building had the intended effect on participants' ratings of the interviewer (maximum possible score = 63) and the interaction (maximum possible score = 49). As shown in Table 3, participants in the rapport conditions gave significantly higher ratings of the interviewer, $F(1,124) = 6.96$, p = .01, η_p^2 = .05, d = 0.47 [0.12, 0.82], and the interaction, $F(1,124) = 9.17$, p < .01, η_p^2 = .07, d = 0.54 [0.18, 0.89], than did those in 'No rapport' conditions.

TABLE 3 Effects of interviewer and witness gaze conditions on rapport ratings in Experiment 3 (standard deviations in parentheses). BF_{01} represents Bayesian evidence for the null hypothesis

Condition							
Rapport-building	Rapport		No rapport		Witness gaze direction	Rapport	Interaction
Witness gaze direction	Facing interviewer	Facing away	Facing interviewer	Facing away	BF_{01}	BF_{01}	BF_{01}
Interviewer rating	48.44 (7.71)	48.88 (6.99)	44.19 (8.57)	45.88 (7.74)	4.08	0.23[a]	3.56
Interaction rating	39.72 (6.16)	38.84 (6.01)	34.91 (6.76)	36.56 (7.46)	5.05	0.09[a]	2.37

[a]Bayes Factors for the effect of rapport building on interviewer and interaction ratings indicate substantial and strong evidence for the alternative hypothesis, respectively.

Witness gaze direction, though, had no significant effects on ratings of the interviewer, $F(1,124) = 0.60$, $p = .44$, $\eta_p^2 < .01$, $d = 0.13$ [−0.21, 0.48], or the interaction, $F(1,124) = 0.11$, $p = .74$, $\eta_p^2 < .01$, $d = 0.06$ [−0.29, 0.40]. There was no interaction between the two independent variables for ratings of the interviewer, $F(1,124) = 0.21$, $p = .65$, $\eta_p^2 < .01$, or the interaction, $F(1,124) = 1.17$, $p = .28$, $\eta_p^2 < .01$. In sum, the rapport manipulation was effective in boosting perceived rapport, and, witness gaze direction had no reliable effect on perceived rapport.

4.2.2 | Free recall

Correct details

Overall, participants recalled between 17 and 55 correct details ($M = 33.09$). As Table 4 shows, a 2 (Witness gaze: Facing interviewer vs. Facing away) x 2 (Rapport-Building: Rapport vs. No rapport) between-subjects ANOVA on the number of correct details reported during free recall showed no significant main effects of witness gaze, $F(1,124) = 2.48$, $p = .12$, $\eta_p^2 = .02$, $d = 0.28$ [−0.07, 0.63], or rapport-building, $F(1,124) = 0.17$, $p = .68$, $\eta_p^2 < .01$, $d = -0.07$ [−0.42, 0.27]. Additionally, there was no significant interaction, $F(1,124) = 0.01$. $p = .93$, $\eta_p^2 < .01$.

Incorrect details

Looking at the number of incorrect details, there was no significant main effect of witness gaze, $F(1,124) = 1.14$, $p = .29$, $\eta_p^2 = .01$, $d = 0.19$ [−0.16, 0.54], or rapport, $F(1,124) = 0.02$, $p = .88$, $\eta_p^2 < .01$, $d = 0.03$ [−0.32, 0.37], nor a significant interaction, $F(1,124) = 0.07$, $p = .80$, $\eta_p^2 < .01$.

Overall accuracy

Finally, we examined overall accuracy; an ANOVA revealed no significant main effects of witness gaze, $F(1,124) = 0.24$, $p = .63$, $\eta_p^2 < .01$, $d = -0.09$ [−0.43, 0.26], or rapport, $F(1,124) = 0.07$, $p = .79$, $\eta_p^2 < .01$, $d = -0.05$ [−0.39, 0.30], nor a significant interaction, $F(1,124) = 0.05$, $p = .82$, $\eta_p^2 < .01$.

Analyses using Bayesian ANOVAs showed anecdotal to substantial evidence for the null hypothesis for all free recall variables (see Table 4).

4.2.3 | Closed questions

Correct responses

As Table 4 shows, a 2 (Witness gaze direction: Facing interviewer vs. Facing away) x 2 (Rapport-building: Rapport vs. No rapport) between-subjects ANOVA on the number of correct responses to questions revealed no significant main effects of either witness gaze direction, $F(1,124) = 1.87$, $p = .17$, $\eta_p^2 = .01$, $d = -0.24$ [−0.59, 0.11], or rapport-building, $F(1,124) = 3.23$, $p = .08$, $\eta_p^2 = .03$, $d = 0.32$ [−0.03, 0.67], nor a significant interaction, $F(1,124) = 1.16$, $p = .28$, $\eta_p^2 = .01$.

Incorrect responses

An ANOVA on the number of incorrect responses revealed no significant main effects of witness gaze, $F(1,124) = 0.00$, $p = .95$, $\eta_p^2 < .01$, $d = 0.01$ [−0.34, 0.36], or rapport-building, $F(1,124) = 2.08$, $p = .15$, $\eta_p^2 = .02$, $d = -0.26$ [−0.60, 0.09]. Additionally, there was no significant interaction, $F(1,124) = 1.14$, $p = .29$, $\eta_p^2 < .01$.

'Don't know' responses

Looking at the number of 'Don't know' responses revealed no significant main effect of witness gaze, $F(1,124) = 2.19$, $p = .14$, $\eta_p^2 = .02$, $d = 0.26$ [−0.08, 0.61], or rapport-building, $F(1,124) = 0.03$, $p = .87$, $\eta_p^2 < .01$, $d = -0.03$ [−0.38, 0.32], nor a significant interaction, $F(1,124) = 0.03$, $p = .87$, $\eta_p^2 < .01$.

Overall accuracy

Finally, an ANOVA on overall accuracy showed no significant main effect of witness gaze, $F(1,124) = 0.05$, $p = .82$, $\eta_p^2 < .01$, $d = -0.04$ [−0.39, 0.31], or rapport-building, $F(1,124) = 2.95$, $p = .09$, $\eta_p^2 = .02$, $d = 0.30$ [−0.04, 0.65], and no significant interaction, $F(1,124) = 0.86$, $p = .36$, $\eta_p^2 < .01$.

TABLE 4 Effects of rapport and witness gaze condition on memory performance variables in Experiment 3 (standard deviations in parentheses)

		Condition						
	Witness gaze direction	Facing interviewer		Facing away		Witness gaze direction	Rapport	Interaction
Response type	Rapport condition	Rapport	No rapport	Rapport	No rapport	BF_{01}	BF_{01}	BF_{01}
Free recall	Correct	31.53 (7.88)	32.28 (8.62)	34.03 (8.86)	34.53 (8.73)	1.70	4.90	3.93
	Incorrect	2.25 (1.57)	2.13 (1.50)	2.50 (1.80)	2.53 (2.05)	3.14	5.24	3.92
	Overall accuracy	0.93 (0.05)	0.94 (0.04)	0.93 (0.05)	0.93 (0.05)	4.74	5.13	3.54
Closed questions (out of 10)	Correct	6.19 (1.12)	6.03 (1.23)	6.13 (1.29)	5.50 (1.27)	2.31	1.25	2.39
	Incorrect	2.53 (1.34)	2.63 (1.10)	2.28 (1.49)	2.91 (1.65)	5.29	2.06	2.66
	Don't know	1.28 (1.05)	1.34 (0.87)	1.59 (1.13)	1.59 (1.21)	1.93	5.23	3.98
	Overall accuracy	0.72 (0.14)	0.70 (0.12)	0.74 (0.15)	0.67 (0.18)	5.18	1.38	2.78

Similarly to free recall analyses above, analyses of the closed questioning data using Bayesian ANOVAs showed anecdotal to substantial evidence for the null hypothesis in all cases.

4.2.4 | Additional analyses

Analyses of social phobia and situational self-awareness are reported in Supporting Information. There was one statistically significant result to note. Namely, when rapport was not built, participants who faced the interviewer had higher levels of public self-awareness compared to those who faced away. In contrast, when rapport was built with participants, there was no significant effect of witness gaze.

5 | EXPERIMENT 4

Experiments 1–3 show minimal effects of facing away, and yet numerous studies show sizeable effects of eye-closure (e.g., Nash et al., 2016; Perfect et al., 2008; Vredeveldt, Hitch, & Baddeley, 2011). It might therefore seem that facing away is not a suitable alternative to closing the eyes in investigative interviews. To test this conclusion directly, in Experiment 4 we compared the effects of facing away from the interviewer with those of closing the eyes.

5.1 | Method

5.1.1 | Participants and design

In total, 72 undergraduate students (60 female, 12 male; age range 18–26; *M* = 19.06, *SD* = 1.34) who did not participate in the earlier experiments took part either for course credits or without compensation. Power analysis indicated this sample size to be appropriate for detecting the interaction effect in our study design, assuming d = 0.5, α = .05, power = .80 and correlation r = .00 between repeated measures. The study used a 2 (Interview type: Control vs. Gaze aversion) x 2 (Gaze aversion method: Facing away vs. Eyes closed) mixed-factor design, with interview type as the within-subjects variable and gaze aversion method as the between-subjects variable. In other words, each participant took part in two interviews: one in which they faced the interviewer and one in which they averted their gaze, either through facing away from the interviewer or eye-closure.

5.1.2 | Materials

All materials were the same as in Experiments 1–3, but this time we used both the car theft film used in Experiments 1 and 2, and the bank robbery film used in Experiment 3.

5.1.3 | Procedure

The study protocol was pre-registered using AsPredicted.org (https://aspredicted.org/79gs7.pdf) and was similar to Experiments 1–3; the main difference was that each participant took part in two interviews, both conducted within one session. Firstly, participants watched the first film-clip, then completed arithmetic puzzles for 10 min and then they were interviewed about the film. After that, the same procedure was repeated for the second film. The order in which the films were presented was counterbalanced.

All participants took part in one control interview, where they were not told anything about gaze aversion and therefore all remained facing the interviewer with their eyes open. All participants also took part in one gaze aversion interview. Within gaze aversion interviews, half of participants were asked to face away from the interviewer by turning their chair 180°, and the other half were asked to close their eyes throughout the interview. Participants were randomly assigned to conditions, and the order in which participants completed the control and gaze aversion interviews was counterbalanced. During both interviews, all participants received the same standardised verbal instructions as in Experiments 1–3, explaining that these arrangements were designed to help them concentrate on remembering.

After each interview, participants were asked 'Can you estimate how much mental effort you had to invest into remembering?' (1 = Very, very low mental effort; 9 = Very, very high mental effort), and 'How easy or difficult was it to remember details about the event?' (1 = Extremely easy; 9 = Extremely difficult). They also completed the situational self-awareness scale and the rapport measure on the computer. At the end of both interviews, participants completed the brief social phobia scale, and provided demographic information before being debriefed.

5.1.4 | Data coding

All responses were coded as in Experiments 1–3, blind to condition. This time, 14 participants' interviews were selected randomly, with two transcripts per participant, and scored by an independent coder who was blind to the experimental conditions. Inter-rater reliability was good for free recall correct details (r = .97) and incorrect details (r = .90). Similarly, reliability was good for correct responses to closed questions (r = .95), incorrect responses (r = .95) and 'Don't know' responses (r = .98). Therefore, the first coder's scores were retained for analyses.

5.2 | Results

5.2.1 | Free recall

Correct details

Overall, participants' correct recall ranged from 10 to 46 details (*M* = 29.04) for control interviews, and from 11 to 61 (*M* = 31.43)

TABLE 5 Effects of gaze aversion on dependent variables in Experiment 4 (standard deviations in parentheses)

	Gaze aversion method	Condition				Interview type	Gaze aversion method	Interaction
		Gaze aversion method – Facing away		Gaze aversion method – Eye-closure				
Response type	Interview type	Facing interviewer (control)	Facing away	Facing interviewer (control)	Eye-closure	BF_{01}	BF_{01}	BF_{01}
Free recall	Correct	29.31 (7.31)	32.00 (9.09)	28.78 (8.97)	30.86 (9.04)	0.34[a]	3.14	4.18
	Incorrect	2.11 (1.86)	2.08 (1.40)	2.00 (2.11)	2.31 (1.62)	5.00	4.50	3.59
	Overall accuracy	0.93 (0.05)	0.94 (0.04)	0.94 (0.05)	0.93 (0.05)	5.52	4.66	2.65
Closed questions (out of 10)	Correct	6.31 (1.21)	6.14 (1.61)	6.03 (1.65)	6.25 (1.71)	5.73	4.35	3.04
	Incorrect	1.69 (1.04)	2.00 (1.39)	2.00 (1.39)	1.67 (1.26)	5.28	4.65	1.27
	Don't know	2.00 (1.15)	1.86 (1.27)	1.97 (1.36)	2.08 (1.75)	5.45	4.67	3.65
	Overall accuracy	0.79 (0.12)	0.76 (0.17)	0.75 (0.16)	0.79 (0.16)	5.67	4.32	1.51

Note: Note that participants in the 'Gaze aversion method – Facing away' condition only faced away in the Facing away condition; likewise, participants in the 'Gaze aversion method – Eye-closure' condition only closed their eyes in the Eye-closure condition.
[a]Bayes Factor for the effect of Interview type on correct details during free recall indicates anecdotal evidence for the alternative hypothesis.

for gaze aversion interviews. Firstly, a 2 (Interview type: Control vs. Gaze aversion) x 2 (Gaze aversion method: Facing away vs. Eye-closure) mixed-factor ANOVA on the number of correct details reported during free recall showed a significant main effect of interview type, $F(1, 70) = 6.34$, $p = .01$, $\eta_p^2 = .08$, $d = 0.28$ [0.06, 0.50], whereby gaze aversion (regardless of whether by facing away or eye-closure) led to more correct details compared to the control condition. A Bayesian approach to this analysis of this effect, however, suggested only anecdotal evidence for the alternative hypothesis (see Table 5). There was no significant main effect of the gaze aversion method, $F(1, 70) = 0.21$, $p = .65$, $\eta_p^2 < .01$, $d = -0.11$ [−0.57, 0.35], and no significant interaction, $F(1,70) = 0.10$, $p = .75$, $\eta_p^2 < .01$.

Incorrect details

An ANOVA on the number of incorrect details showed no main effect of interview type, $F(1,70) = 0.25$, $p = .62$, $\eta_p^2 < .01$, $d = 0.08$ [−0.23, 0.39], or gaze aversion method, $F(1,70) = 0.03$, $p = .86$, $\eta_p^2 < .01$, $d = 0.04$ [−0.42, 0.51], nor a significant interaction, $F(1,70) = 0.36$, $p = .55$, $\eta_p^2 < .01$.

Overall accuracy

Next, an ANOVA on the measure of overall accuracy revealed no significant main effect of interview type, $F(1,70) = 0.05$, $p = .83$, $\eta_p^2 < .01$, $d = -0.03$ [−0.34, 0.27], or gaze aversion method, $F(1,70) = 0.04$, $p = .85$, $\eta_p^2 < .01$, $d = -0.06$ [−0.52, 0.41]. Finally, there was no significant interaction, $F(1,70) = 0.90$, $p = .35$, $\eta_p^2 = .01$.

Beside the effect of gaze aversion on correct details, Bayesian ANOVAs showed anecdotal to substantial evidence for the null hypothesis for all other effects.

5.2.2 | Closed questions

Correct responses

As shown in Table 5, a 2 (Interview type: Control vs. Gaze aversion) x 2 (Gaze aversion method: Facing away vs. Eye-closure) mixed-factor ANOVA on the number of correct responses showed no significant main effect of interview type, $F(1,70) = 0.01$, $p = .91$, $\eta_p^2 < .01$, $d = 0.02$ [−0.28, 0.32], or gaze aversion method, $F(1,70) = 0.09$, $p = .77$, $\eta_p^2 < .01$, $d = -0.07$ [−0.53, 0.39]. Additionally, there was no significant interaction, $F(1,70) = 0.66$, $p = .42$, $\eta_p^2 = .01$.

Incorrect responses

Looking at the number of incorrect responses, an ANOVA showed no significant main effect of interview type, $F(1,70) = 0.01$, $p = .95$, $\eta_p^2 < .01$, $d = -0.01$ [−0.33, 0.30], or gaze aversion method, $F(1,70) < 0.01$, $p = .95$, $\eta_p^2 < .01$, $d = -0.02$ [−0.48, 0.45], and no significant interaction, $F(1,70) = 2.45$, $p = .12$, $\eta_p^2 = .03$.

'Don't know' responses

An ANOVA on the number of 'Don't know' responses again revealed no significant main effect of interview type, $F(1,70) < 0.01$, $p = .96$, $\eta_p^2 < .01$, $d = -0.01$ [−0.36, 0.34], or gaze aversion method, $F(1,70) = 0.20$, $p = .65$, $\eta_p^2 < .01$, $d = 0.11$ [−0.35, 0.57]. There was also no significant interaction, $F(1,70) = 0.25$, $p = .62$, $\eta_p^2 < .01$.

Overall accuracy

Finally, an ANOVA on overall accuracy revealed no significant main effect of interview type, $F(1,70) < .01$, $p = .99$, $\eta_p^2 < .01$, $d = -0.01$ [−0.30,0.29], or gaze aversion method, $F(1,70) = 0.02$, $p = .89$, $\eta_p^2 < .01$, $d = -0.03$ [−0.50, 0.43]. There was no significant interaction, $F(1,70) = 2.34$, $p = .13$, $\eta_p^2 = .03$.

TABLE 6 Estimates of overall effects of the witness facing away from the interviewer (relative to facing the interviewer) on each memory outcome measure, based on mini meta-analyses of Experiments 1–4

Response type		Standardized difference in means (Cohen's *d*)	95% confidence interval		*p*
			Lower limit	Upper limit	
Free recall	Correct	0.15	−0.05	0.36	.15
	Incorrect	−0.01	−0.22	0.19	.90
	Overall accuracy	0.08	−0.13	0.28	.47
Closed questioning	Correct	−0.09	−0.32	0.14	.45
	Incorrect	0.01	−0.31	0.33	.95
	Don't know	0.12	−0.09	0.32	.26
	Overall accuracy	−0.02	−0.35	0.32	.93

Note: These analyses exclude the data from those participants assigned to the eye-closure condition of Experiment 4.

Analyses conducted using mixed-measures Bayesian ANOVAs indicated anecdotal to substantial evidence for the null hypothesis for all effects (see Table 5).

5.2.3 | Additional analyses

Analyses of interview difficulty, mental effort, rapport with the interviewer, social phobia and situational self-awareness are reported in Supporting Information. Two significant effects were noteworthy. Firstly, participants who closed their eyes during their gaze aversion interview rated their two interviews (i.e., averaged across the control and gaze aversion interviews) as more difficult than did participants who faced away. Secondly, participants reported greater mental effort in their gaze aversion interview than in their control interview.

6 | EFFECT SIZE ESTIMATION

To estimate the size of the witness gaze direction effects observed across four experiments, we conducted random-effects mini meta-analyses (Goh, Hall, & Rosenthal, 2016). In these analyses, a positive overall effect size (i.e., $d > 0$) would indicate that when witnesses faced away from the interviewer, scores on a particular variable were generally higher than when witnesses faced the interviewer. Likewise, a negative overall effect size ($d < 0$) would indicate that when witnesses faced away from the interviewer, scores were generally lower than when witnesses faced the interviewer.

As Table 6 shows, the effects of facing away were very small and non-significant for all variables, with all 95% confidence intervals including zero as a plausible effect size. In other words, there is no clear evidence that witness gaze direction affected participants' memory performance in any way.

7 | DISCUSSION

In all four experiments reported here, we found little evidence that facing away from an interviewer benefited witnesses' memory performance in mock investigative interviews. Specifically, free recall of correct details was only significantly enhanced in Experiment 4, and there were small, anecdotal benefits to accuracy during closed questioning only in Experiment 2. Importantly, the effects of witness facing away were minimal even when the interviewer also faced away (Experiment 2), and regardless of whether or not rapport was built beforehand (Experiment 3). Effect size estimation across all experiments showed very small effect sizes associated with facing away.

These overall findings are surprising in light of previous research that tends to reveal benefits of averting the gaze while performing cognitive tasks (e.g., Markson & Paterson, 2009). One explanation might be that the act of turning around makes participants feel uncomfortable because, for example, they are self-aware of what is happening behind them, and that this side-effect undermines the technique's benefits. We found minimal support for this explanation, as in Experiment 2, the lack of a witness gaze direction effect held even when participants knew the experimenter was not watching them, and facing away from the interviewer had no consistent effects on participants' situational self-awareness or rapport ratings across experiments. Nevertheless, it may be that our rapport measure was insufficiently sensitive to detect differences between conditions; indeed, when we directly manipulated rapport in Experiment 3, the effect on their rapport ratings, although statistically significant, was small. This account might also explain why we found no main effect of rapport-building on memory performance in Experiment 3, although we note that such rapport effects seem less consistent in the literature than previously believed (e.g., Sauerland, Brackmann, & Otgaar, 2018). This inconsistency in results seems partly due to the lack of a reliable definition and operationalising of rapport in research and practice, suggesting the need for further research and replications (see Vallano & Schreiber Compo, 2015).

Whereas ours is the first investigative interviewing study to ask witnesses to fully face away from the interviewer, one might expect that doing so would have similar beneficial effects as those seen in previous gaze aversion and eye-closure studies. However, the results of Experiment 4 caution us against concluding that facing away is less effective than eye-closure. In fact, both techniques were similarly beneficial in that experiment. That is to say, the eye-closure effects here were also much smaller than those observed in most prior

published studies. It might therefore be reasonable to conclude from these data that the effects of gaze aversion are not necessarily always as large as many prior studies have indicated. Indeed, our findings are not entirely inconsistent with the broader literature, and the effects of eye-closure do often depend on contextual factors such as being interviewed inside or outside, and the modality of questioning (e.g., Vredeveldt et al., 2013; Vredeveldt & Penrod, 2013). For example, one limitation of the present research is the short delay between the event and the interview. Here we mimicked procedures used in other similar studies that used short delays (e.g., Perfect et al., 2008; Vredeveldt et al., 2011); however Vredeveldt et al. (2013) only found a benefit of witness eye-closure after a delay of 1 week (compared to a delay of 2 min). In practice, there would normally be a delay of more than just minutes when carrying out an investigative interview, so this is an important limitation to consider.

Similarly, within all experiments here, we focused on any information provided by participants, rather than specifically analysing details that were central to the crime. However, both kinds of detail may be worth exploring separately. For example, Vredeveldt et al. (2015) found that witnesses who closed their eyes during a genuine police interview reported no more information overall, but the information they provided was more forensically relevant as compared to the information provided by witnesses who kept their eyes open. Due to the absence of meaningful auditory information in both of our stimulus videos, we were also unable to test for modality effects in our data. However, given that both the general cognitive load hypothesis and the modality-specific hypothesis predict effects on visual memory, which we did not observe, it seems unlikely that the inclusion of auditory detail would have given more theoretically informative results.

Overall, we found minimal evidence that witnesses' gaze direction affected their memory performance. Situated within the broader literature on other forms of gaze aversion, these findings caution us against overestimating the benefits of eyewitness gaze aversion as a tool for investigative interviewing. To provide legal psychologists and practitioners a scientifically robust assessment of these benefits, it is essential that non-significant findings such as ours feature alongside the positive findings in the cumulative published literature (Nelson, Simmons, & Simonsohn, 2018).

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

ORCID

Alena Nash https://orcid.org/0000-0002-6065-9590

Robert A. Nash https://orcid.org/0000-0002-2284-2001

ENDNOTE

[1] Across Experiments 1–4, most dependent variables approximated a normal distribution. For those variables that deviated appreciably from normal, we also conducted non-parametric tests of main effects. In these non-parametric tests the results matched those of their parametric equivalents, and so only the results of parametric tests are reported here. There was one exception in Experiment 2, and for this test we report the results of both the parametric and non-parametric tests.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available at https://doi.org/10.17036/researchdata.aston.ac.uk.00000402

ORCID

Alena Nash https://orcid.org/0000-0002-6065-9590

Robert A. Nash https://orcid.org/0000-0002-2284-2001

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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